



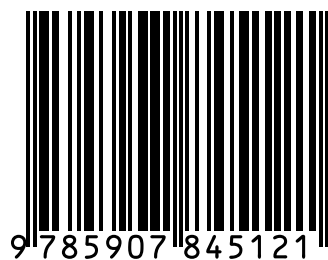
# BRICS+ Energy: A Mover for the New World Order

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Alexei Grivach

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ISBN 978-5-907845-12-1



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# Introduction.

## From the ‘Third World’ to outpacing growth

In 1989, a few months before the fall of the Berlin Wall, Francis Fukuyama, a mid-level US State Department official, answered in the affirmative to his own question asked in an essay with the same title ‘The End of History?’ published in *The National Interest* magazine. With the socialist camp beginning to crumble, the publication immediately earned him international renown, and a few years later, the catchphrase came to underpin the foreign policy of the United States and the collective West, the absolute world hegemon dominating the military, economic, energy and socio-cultural spheres after the collapse of the Soviet Union and the Soviet bloc. At that time, in the early 1990s, the members of the Group of Seven, formed in the mid-1970s by the world’s leading industrialised nations<sup>1</sup>, had indeed achieved fantastic dominance. Those countries were home to less than 14 percent of the world’s population, yet they accounted for more than three-quarters of global GDP in nominal terms, and for more than half of global GDP based on purchasing power parity (PPP). The same pattern was observed in energy, where 30 years ago, the G7 accounted for 50 percent of primary energy consumption, 57 percent of global oil demand, just over 50 percent of gas consumption and almost 60 percent of global power generation.

A decade later, the economic and energy situation began to change. Jim O’Neill, head of economic research at *Goldman Sachs*, released the *Building Better Global Economic BRICs* report in late 2001, using the acronym as an umbrella term for the five most promising ‘bricks’ for building a better global economy of the future – Brazil, Russia, India and China. In 2002, these countries accounted for 42 percent of the global population, but only 8 percent of nominal global GDP and 18.5 percent of PPP, and about 23 percent of primary energy consumption. The term could have remained a specimen of British financial and economic verbal acrobatics, but in 2006, the foreign ministers of Brazil, Russia, India and China did meet on the sidelines of the UN General Assembly, each of

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<sup>1</sup>The G7 includes Canada, France, Germany, Italy, Japan, the United Kingdom and the United States. EU representatives were first invited to a G7 summit in 1977, and since the summit in Ottawa (1981) the EU has participated in all G7 events. The EU enjoys the same rights as the other G7 members, except for the presidency and holding of summits.

the parties expressing interest in developing quadrilateral relations. In 2009, the first BRIC summit took place in Yekaterinburg. A year later, South Africa officially joined the BRIC group, turning it into BRICS, and in 2015, O'Neill, a native of a southern suburb of Manchester, was granted the title Baron of Gatley (the place where he was born and raised), a life peerage and membership in the British House of Lords.

The 20<sup>th</sup> anniversary of Fukuyama's 'end of history' was marked by a major shift in the balance of power between the industrialised G7 and the ambitious five 'bricks.' In 2012, the BRICS countries' nominal GDP exceeded \$15 trillion or 20 percent of the global total, having ballooned fivefold in ten years. In turn, the G7's share shrank to 55 percent from 73 percent in 2002. By purchasing power parity, the figures have converged even more closely, with the G7 advanced economies accounting for \$40.4 trillion of the \$100.8 trillion global GDP (PPP), while the BRICS contributing \$28.5 trillion (according to World Bank data). In 2012, for the first time in history, the BRICS economies surpassed the G7 in primary energy consumption, while China overtook the US to become the world's sole leader in energy demand in 2009.

Finally, the year 2022, which brought the most serious geopolitical crisis since World War II, marked a new anchor point for the still unofficial yet already tangible confrontation between the G7 and BRICS, not only in the economic race, but also in energy and even in politics. The BRICS countries accounted for 40 percent of global energy demand and almost 44 percent of global power generation, while the G7's share in both had fallen below a third. In nominal GDP terms, the developed countries are still well ahead of BRICS – 51 percent versus 26 percent. However, in PPP terms, the BRICS economies are lagging behind the G7 by a mere 4.5 percentage points – \$55.8 trillion versus \$63.2 trillion.

Furthermore, the decision on a second BRICS expansion was made at the South African summit in 2023. Official invitations were extended to six countries that had previously applied to join the association – Argentina, Egypt, Ethiopia, Iran, Saudi Arabia and the United Arab Emirates. Argentina officially declined the invitation after the presidential election, but the other five new members have significantly altered the group's economic landscape (BRICS retained its name after the enlargement). Their combined GDP (PPP) was \$5.5 trillion in 2022, which virtually equalled the size of the BRICS and G7 economies, not to mention the addition of the Middle Eastern hydrocarbon powers, which dramatically changed the balance of power in the energy sector, something we will discuss in more detail in this report.

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# Current energy balances of BRICS and the G7

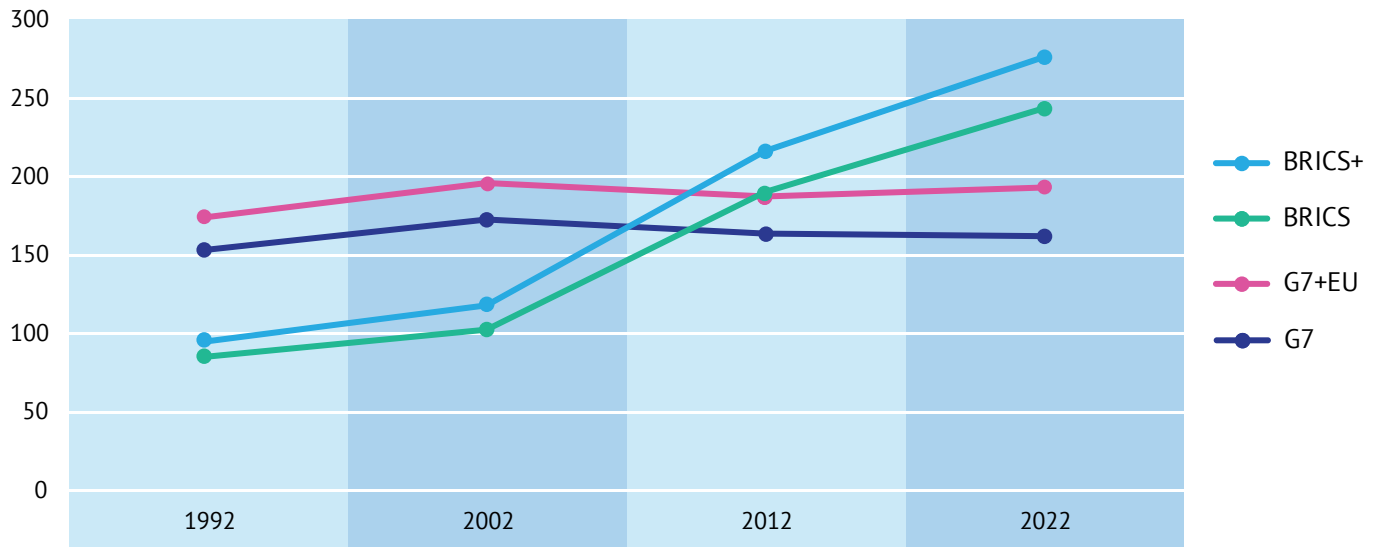
Even in the original five-country format, BRICS looked like a formidable energy conglomerate. It included the world's largest hydrocarbons exporter (Russia) and the largest consumer of energy resources (China). After the expansion on January 1, 2024, the group emerged as a real energy giant. With the addition of the three hydrocarbon powers, BRICS now holds about 40 percent of the world's proven oil reserves and more than 50 percent of gas reserves. On the demand end, the group accounts for 47 percent of the planet's primary energy consumption, almost 50 percent above that of the G7 countries (including the European Union).

It is a hard fact that the centre of energy consumption is shifting from the developed countries, united under the G7 brand, to the so-called 'emerging markets.' But the scale of that transformation over the last thirty years has been truly monumental. In 1992, the G7 countries and formally non-EU countries consumed 174.5 exajoules of primary energy, providing just over half of global demand; in 2022, the group's consumption grew by just 11 percent and its share fell to 32 percent. Overall, global energy demand jumped 73 percent over the three decades.

In 1992, the nations that are currently members of the BRICS group used just 95.3 exajoules, or 27 percent of the world's primary energy, which was just over a half of what the current G7 members (including the EU) consumed. Thirty years later, the BRICS' energy demand surged by 190 percent to 276 exajoules, and its share of the total exceeded 45 percent. In other words, the roles of First World and 'developing' world leaders reversed.

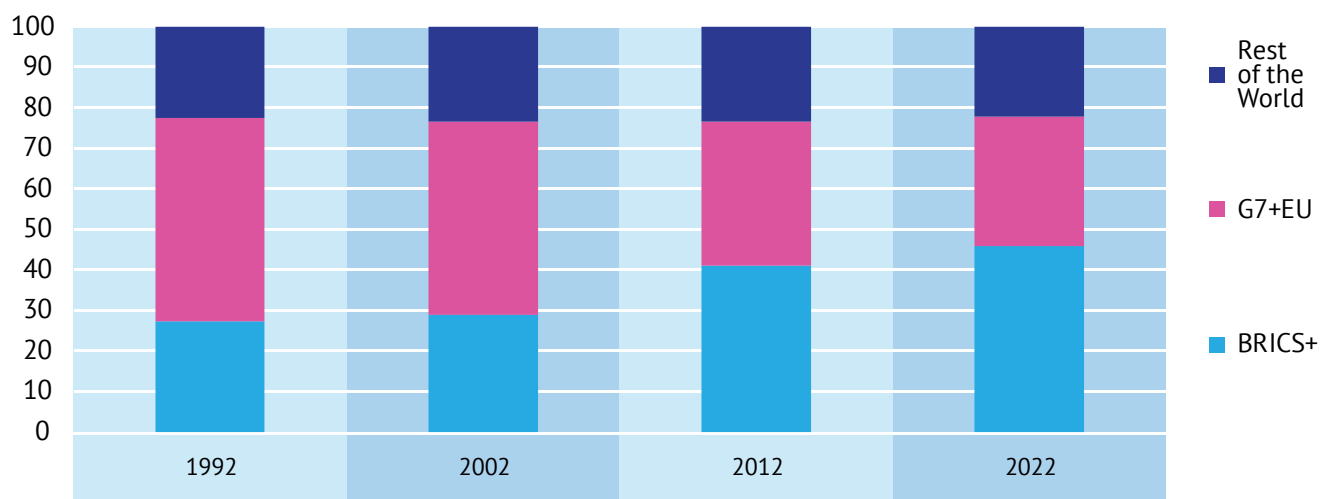
The energy balances of the G7 and BRICS countries are very different. BRICS is a stronghold of coal consumption, primarily due to China and India, whose energy consumption is dominated by coal. As a result, BRICS is the source of 70 percent of global coal demand, which was five times the share of the G7, including the EU, by the end of 2022.

## PRIMARY ENERGY CONSUMPTION, EJ



Source: Energy Institute Statistical Review of World Energy, calculated by the author

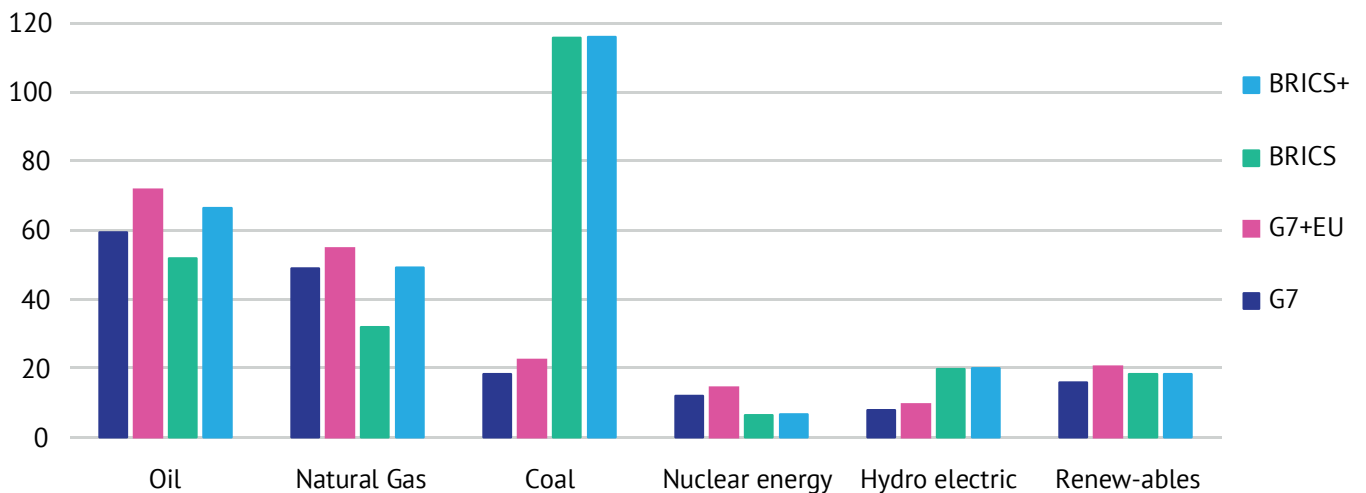
## PRIMARY ENERGY CONSUMPTION, %



Source: Energy Institute Statistical Review of World Energy, calculated by the author

When it comes to oil and natural gas, the developed world is still ahead, although the gap has narrowed to only 7-9 points since the new BRICS members joined the club. In nuclear power, the gap is more impressive, 120 percent. In hydropower, however, BRICS is twice as far ahead of the G7, and in other types of renewable energy (excluding solid

## PRIMARY ENERGY CONSUMPTION BY FUEL IN 2022, EJ



Source: Energy Institute Statistical Review of World Energy, calculated by the author

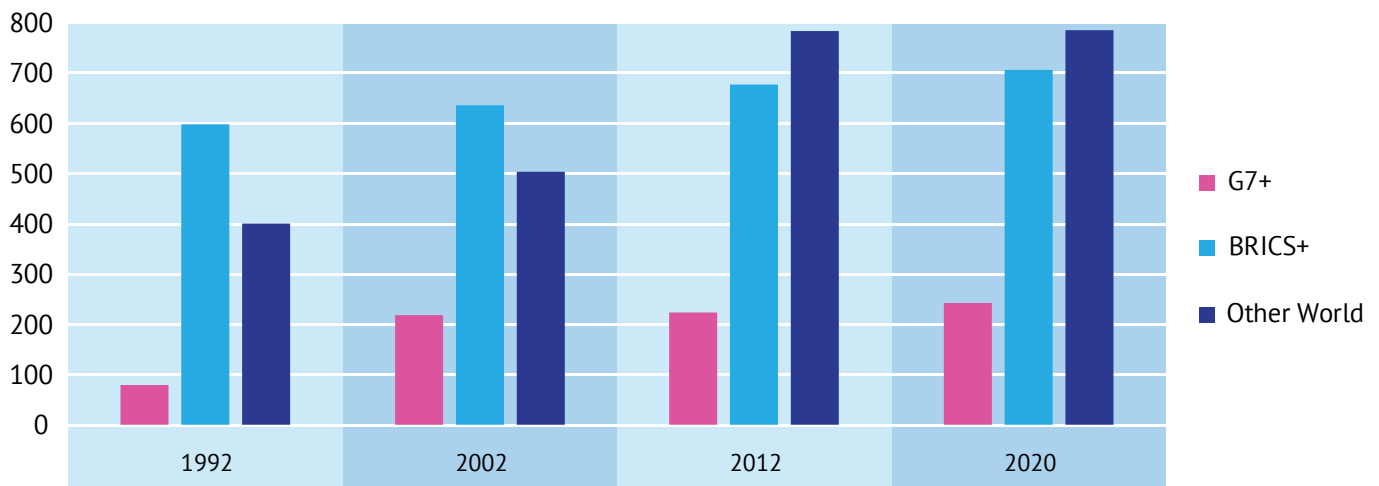
biomass), it is rapidly catching up with developed economies. In 2022, BRICS consumed 18.4 exajoules of energy from new renewables, while the G7, together with the EU, used 20.5 exajoules.

## Oil industry

As noted above, oil remains the world's top energy source and accounts for over a third of the overall energy mix. It also dominates international trade in commodities. This makes studying the way oil reserves, its production and demand for oil are distributed across the G7 countries, BRICS and the rest of the world, and how this distribution has evolved over the past 30 years, particularly insightful and captivating.

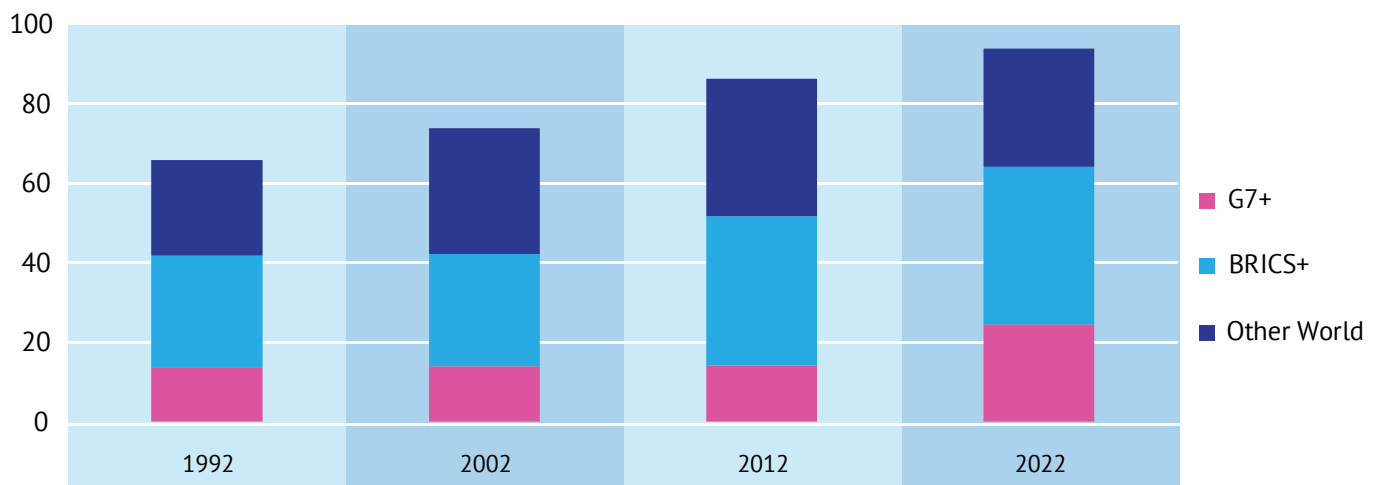
As of 2020, the world had an estimated 1.7 trillion barrels in oil reserves, which would last it for fifty more years subject to keeping production at the current level. There is a paradox, however, in that despite all the wailing about the finite nature of the black gold and its reserves, its proven reserves increased by 60 percent since 1992, while oil production increased by more than 40 percent over this period.

## PROVED OIL RESERVES, BILLION BARRELS



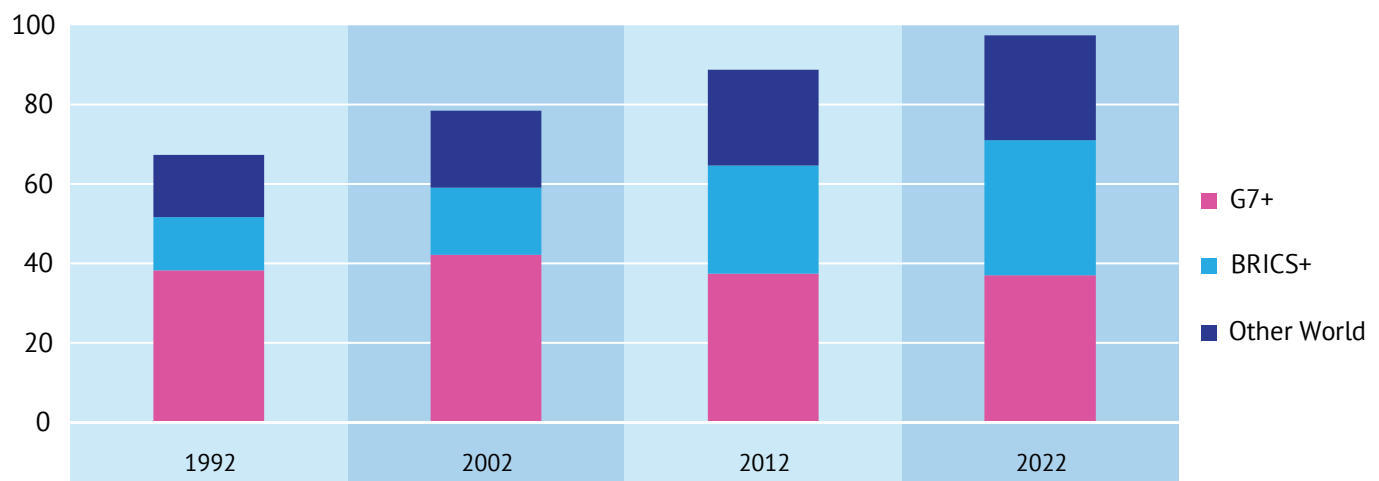
Source: Energy Institute Statistical Review of World Energy, calculated by the author

## OIL PRODUCTION, MILLION BARRELS A DAY



Source: Energy Institute Statistical Review of World Energy, calculated by the author

## OIL CONSUMPTION, MILLION BARRELS A DAY



Source: Energy Institute Statistical Review of World Energy, calculated by the author

In relative terms, the G7 countries reported the fastest growth rates for their oil reserves. Estimated at 80 billion barrels in 1992, they tripled by the early 2020s. This was, of course, largely attributable to heavy oil from Canada's tar sands and the shale oil in the United States, but the result is still quite impressive. During the same period, oil reserves in the BRICS countries increased by just 108 billion barrels, or by 18 percent.

That said, in terms of production volumes, the G7 and BRICS+ were more or less on par with about 10 million barrels per day over the past 30 years. Still, the BRICS+ countries have been extracting 60 percent more oil compared to developed countries.

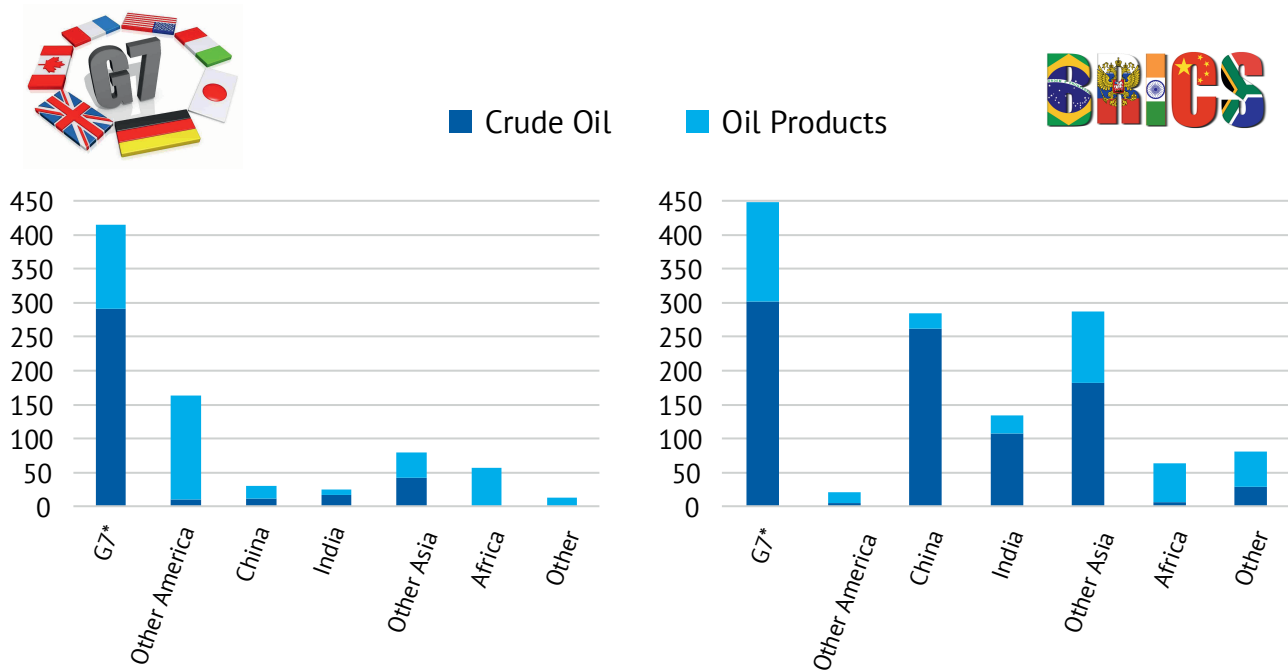
At the same time, despite a certain decline in oil consumption over the past 20 years, the G7 countries stayed ahead of the BRICS+ in terms of demand for oil, and therefore experience a significant production deficit. In fact, the oil they produce themselves covers about a third of their demand, while the BRICS+ countries benefit from a nominal surplus of about 5 million barrels per day.

This enabled the United States, Canada, Japan and Europe to dominate oil trade. In 2022, the United States and Canada – there are no other exporters of hydrocarbons within the G7 – delivered 291 million tonnes of crude oil to the G7 markets, while developed countries imported another 301 million tonnes from the BRICS countries. Therefore, the G7 accounted for almost 600 million tonnes of oil for a global market of about 2.13 billion tonnes, or 28 percent. These countries imported a total of about 970 million tonnes of oil, or 46 percent of the global market.

As for the BRICS imports, assessing them based on the available statistics is quite challenging. One thing is certain: so far, BRICS has been trailing the developed economies in this regard. China and India are the main importers within BRICS. In 2022, they bought 739 million tonnes of crude oil, with China accounting for over two thirds of this volume. Half of this volume, or 369 million tonnes, came from the BRICS countries, while the G7 supplied just 4 percent, or 29 million tonnes.

As for the exports of petroleum products, the G7 and BRICS reported similar results in 2022 at 411 million tonnes and 427 million tonnes, respectively, or 33 percent and 34 percent. In this context, the United States, Canada, Japan and European countries imported 123 million tonnes of petroleum products from other G7 countries. In the meantime, they supplied 153 million tonnes, primarily from the United States, to Latin America, sent 65 million tonnes to Asia, including just 27 million tonnes to China and India, while African countries imported 57 million tonnes of petroleum products from the developed world.

## OIL EXPORT 2022, MILLION TONES



\*The G7 countries include all countries designated as belonging to the European region as per the EI statistics, except for Norway.

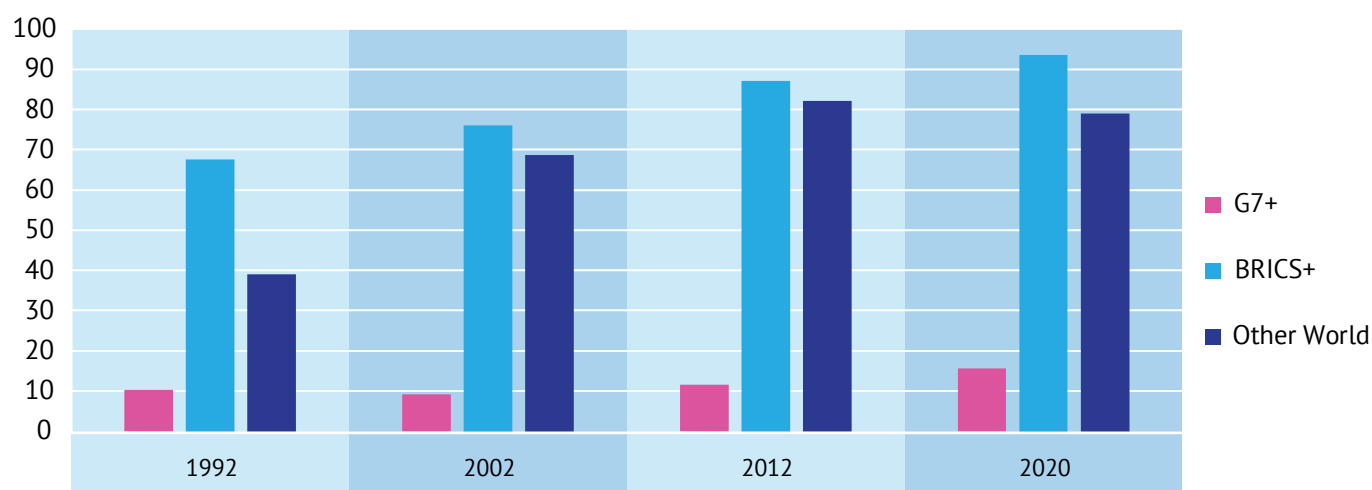
Source: Energy Institute Statistical Review of World Energy, calculations by the author

The G7 was the prime destination for petroleum imports from the BRICS countries with 140 million tonnes. China and India imported a total of 50 million tonnes, while other Asian countries imported 105 million tonnes, followed by Africa with 57 million, Latin America at 16 million, and all other countries at 52 million tonnes.

## The gas sector

The gas sector may potentially come to dominate the global energy mix, although so far its development has been quite erratic, at least statistics-wise. On the one hand, reserves, production volumes and international trade in natural gas have been demonstrating faster growth rates compared to the oil market. The proven global natural gas reserves increased by 61 percent between 1992 and 2020, from 116 trillion cubic metres to 188 trillion cubic metres, while production and consumption over the past thirty years (1992-2022) almost doubled. In 2022, natural gas production exceeded 4 trillion cubic metres, while, according to the *Energy Institute*, the demand was slightly below this 4 trillion threshold,

## PROVED NATURAL GAS RESERVES, TCM



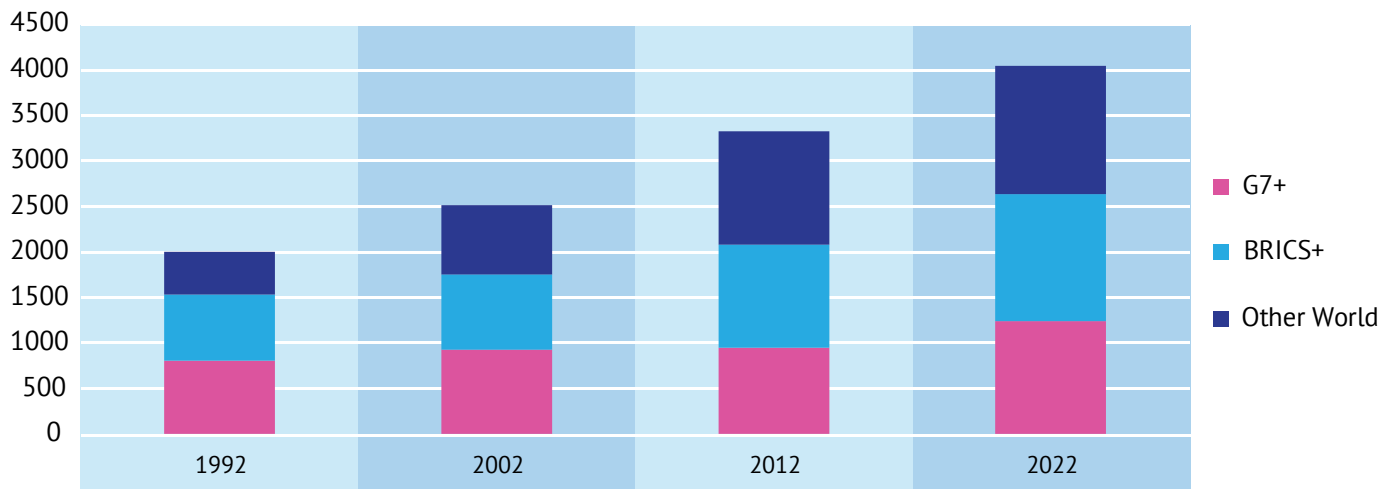
Source: Energy Institute Statistical Review of World Energy, calculated by the author

which could be attributed to the crisis in terms of gas pricing on the market. At the same time, the gas industry fell behind the oil sector in terms of the availability of reserves in 2020. Gas reserves were expected to last 58 years in 1992, but by 2020 this figure decreased to 49 years. Therefore, the rate of reserves' replenishment is below production rates.

Moreover, the BRICS+ countries have been trailing the G7, including the EU countries, and the world in general, in terms of reserves. Since 1992, the BRICS+ increased their gas reserves by 38 percent to 26 trillion cubic metres, while the G7 saw an increase of 53 percent (5 trillion cubic metres), and the rest of the world doubled its reserves (40 trillion cubic metres). On the other hand, the concentration of reserves tends to be higher for the gas sector. In fact, within the G7, the United States accounts for 80 percent of gas reserves, while the European share (the EU and the UK) decreased from 30 percent down to 4 percent. There is also a major imbalance within the BRICS+ with Russia and Iran accounting for three fourth of the reserves. Truth be said, China, which is also the world's largest gas importer, has increased its share in the BRICS+ reserves from 2 percent in 1992 to 9 percent in 2020.

There is a similar concentration trend outside of the two associations with two countries – Qatar and Turkmenistan – accounting for over 60 percent of reserves. Therefore, almost two thirds of the global natural gas reserves belong to just five countries, namely Russia, Iran, Qatar, Turkmenistan and the United States.

## NATURAL GAS PRODUCTION, BCM

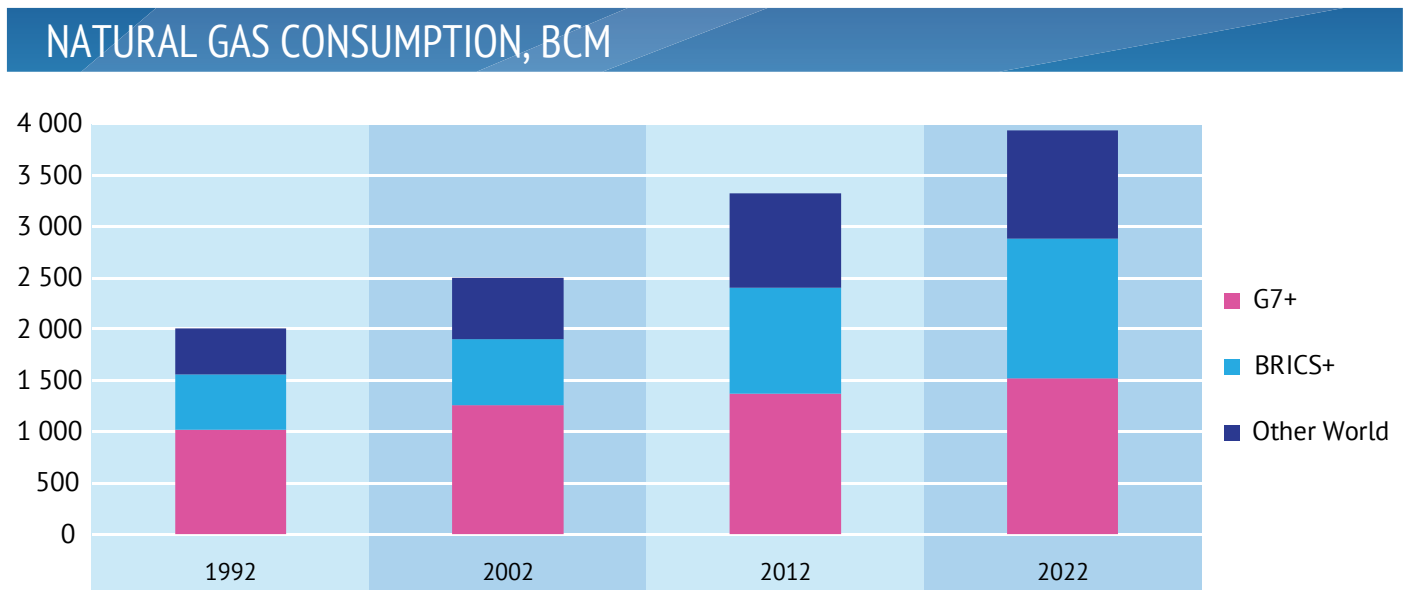


Source: Energy Institute Statistical Review of World Energy, calculated by the author

However, the situation is completely different in terms of production. In 1992, the G7 accounted for 40 percent of global gas output, while the countries now forming the BRICS+ produced 36 percent, which left other countries of the world just over a quarter of the global output. But the 2022 data tell a different story. Over the past 30 years, the G7 increased its gas output by a factor of 1.5, while its share decreased to 31 percent. As for the BRICS+ countries, they have almost doubled their output. Still, their market share also declined to 34 percent. Third countries accounted for much of the growth, having almost tripled their gas production between 1992 and 2022. This makes a serious case for optimism in terms of the development prospects for the gas sector and expanding the gas consumption infrastructure.

As for gas consumption, the G7 developed countries have retained their leadership in 2022. The demand there exceeded 1.5 trillion cubic metres, or almost 39 percent of the global market, although in 1992 they accounted for half of global consumption. The BRICS+ economies increased their gas consumption 2.5-fold from 0.54 trillion cubic metres to 1.36 trillion, while the rest of the world witnessed a 2.4-fold increase from 450 bcm to 1.06 trillion cubic metres.

The G7 plays an even bigger role on the global gas market, compared to the oil sector, which is quite natural from a historical perspective. This is especially true for pipeline gas, since developed countries have been building gas pipelines, expanding their import infrastructure and market for many decades now. In 2012, the G7 countries imported about 450 bcm of natural gas, or 63 percent of the global pipeline gas, while

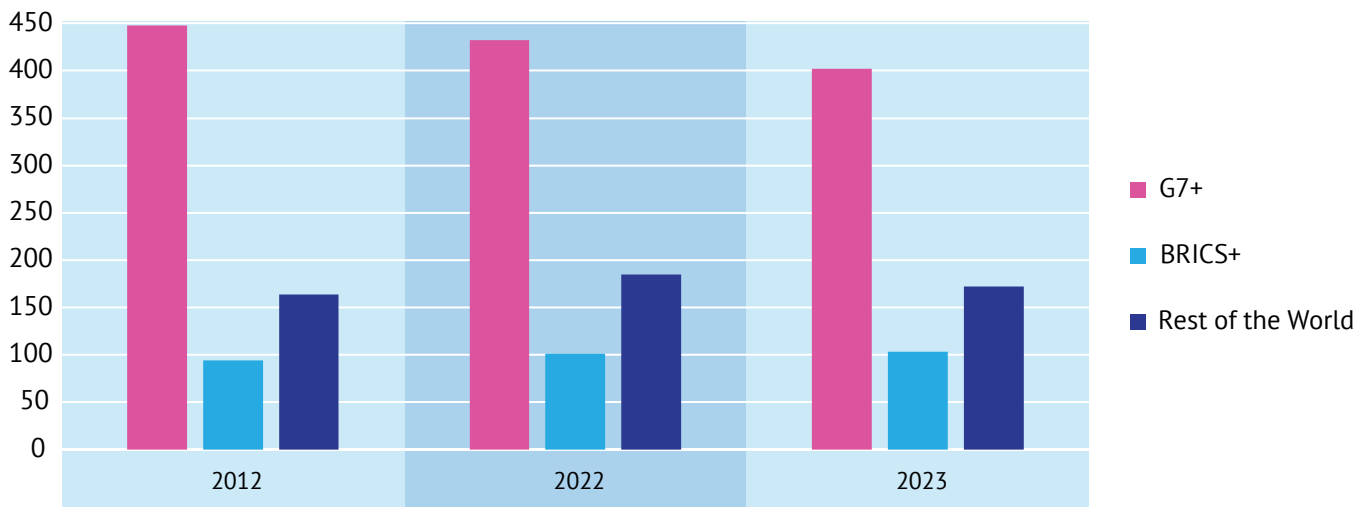


Source: Energy Institute Statistical Review of World Energy, calculated by the author

the same indicator for the BRICS+ countries was equal to just over 94 bcm, or almost five times less compared to the developed world, or 13 percent of the global cross-border trade in pipeline gas. In 2022, the EU trimmed down its pipeline gas imports from Russia, but this was offset by an increase in pipeline gas sales between the United States and Canada. At the end of the day, pipeline gas imports for the G7 countries decreased to 433 bcm, or 60 percent, while the BRICS+ countries went above the 100 bcm threshold – Russia delivered more natural gas to China via the Power of Siberia pipeline, even if the share of the BRICS+ countries on the global market increased by a meagre 1 percentage point. This trend spilled over into 2023, as Russia's supplies to the EU continued to decline in the wake of the Nord Stream bombings and efforts to destroy the European gas market against the backdrop of skyrocketing prices and regulatory restrictions.

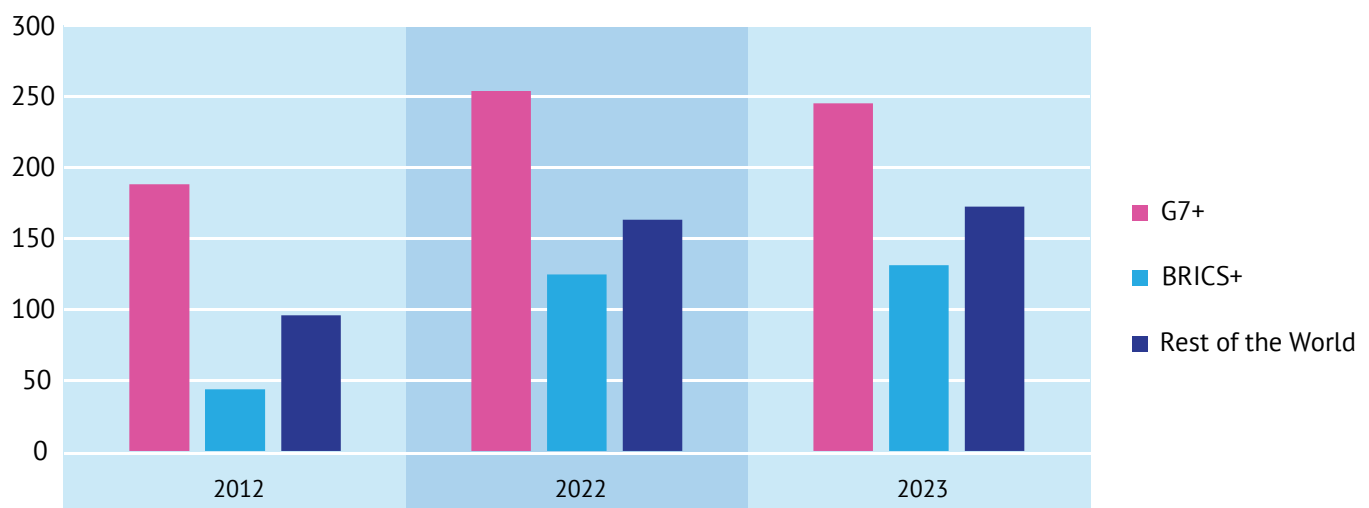
According to *EI Statistical Review of World Energy*, the pipeline gas market did not expand all that much between 2012 and 2022, having grown 1.7 percent, from 706 bcm to 718 bcm. It even shrank to 677 bcm in 2023, which was attributed to an energy crisis and geopolitical tension. These factors undermined demand for gas in Europe and impacted gas supplies to this region. Against this backdrop, there was a surge in the LNG market. In 2012, the global LNG market totalled 328 bcm, with the G7 countries accounting for 57 percent, or 188 bcm. Interestingly, the G7 countries produced and exported just 0.8 bcm of LNG. That said, the BRICS countries also fell behind in terms of LNG imports with less than 44 bcm, or 13 percent, in 2012, while their exports totalled 29 bcm, or less than 9 percent.

## PIPELINE NATURAL GAS IMPORTS, BCM



Source: Energy Institute Statistical Review of World Energy, calculated by the author

## LNG IMPORTS, BCM

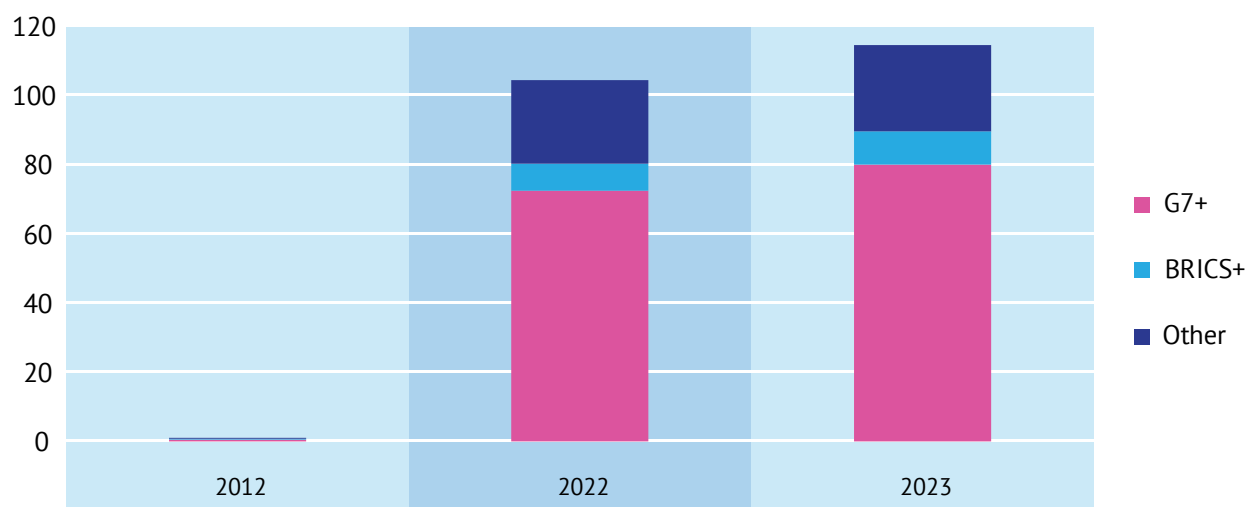


Source: Energy Institute Statistical Review of World Energy, calculated by the author

Fast forward ten years, and the global market expanded 1.7 fold to 524 bcm. The G7 countries retained their leadership with 254 bcm in imports, even if their share declined to 47 percent. In 2022, the BRICS+ countries imported 125 bcm of LNG, or 23 percent of the global market, having almost tripled this indicator compared to 2012.

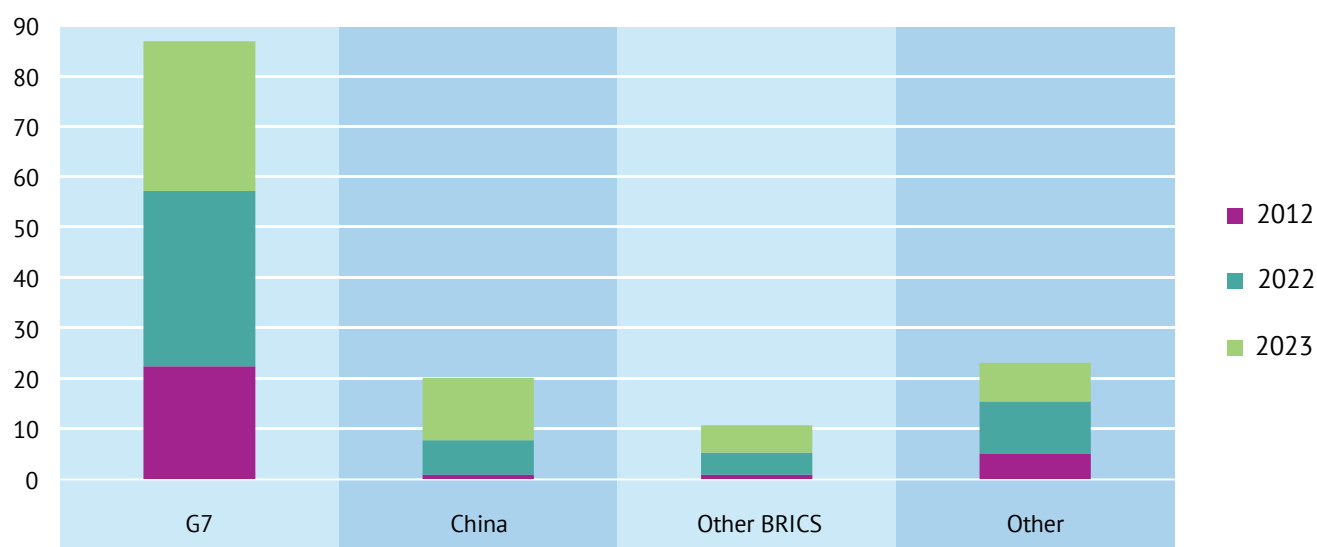
In terms of exports, the United States emerged as a top LNG producer, enabling the G7 to increase its market share from near zero to

## G7 LNG EXPORTS, BCM



Source: Energy Institute Statistical Review of World Energy, calculated by the author

## BRICS+ LNG EXPORTS, BCM



Source: Energy Institute Statistical Review of World Energy, calculated by the author

20 percent at 104 bcm. Of this total, 72 bcm, or 69 percent, was delivered to other developed countries, mostly in the EU. The BRICS+ countries received less than 8 bcm of LNG, or 7.5 percent, from the United States. As for the BRICS+ countries in terms of LNG production and exports, they have also upped their game in this sector by increasing their performance 1.9-fold to 56 bcm. Of this total, 34 bcm, or 61 percent, went to the G7 countries, while partners within the BRICS+ received just over 11 bcm, or 20 percent.

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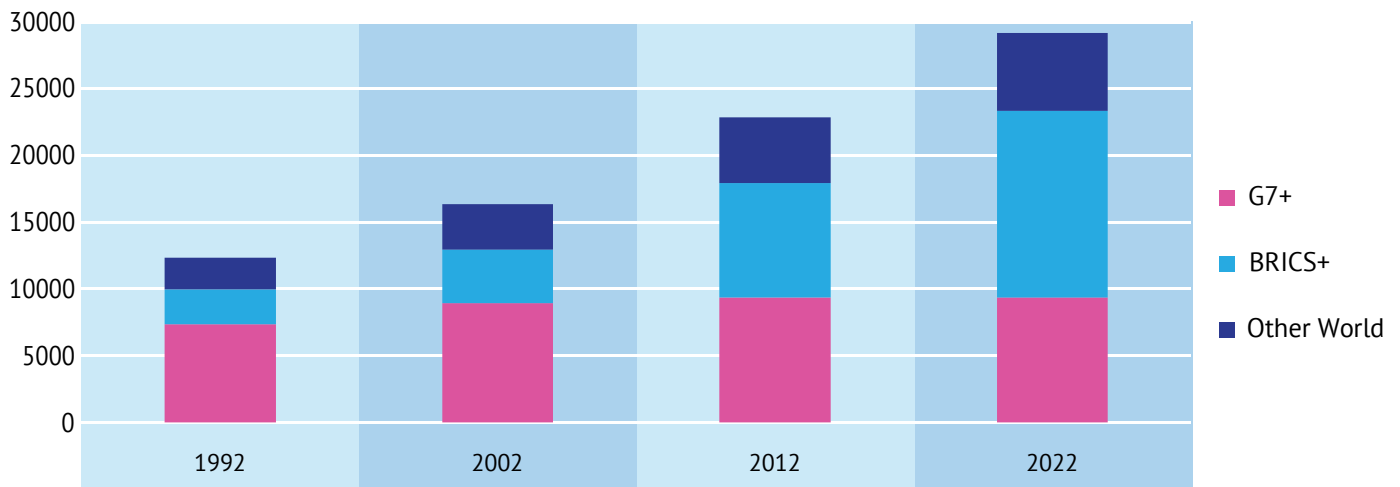
# Electricity generation

The occurrence of natural resources around the world largely defines the oil and gas sector. This makes the situation in terms of electric power generation much more indicative in terms of demonstrating how the global centre of economic power is shifting from the G7 countries to BRICS+, which is also happening in the energy sector. Electricity generation and consumption indicators and the way they evolve offer a good insight into economic development. Over a 30-year period between 1992 and 2022, the share of electric power in the global energy mix increased from 35 percent to 47 percent, meaning that this sector expanded almost three times faster compared to the global average according to NESF calculations based on Energy Institute statistics. Considering the trend to transition to electrical transport vehicles and the development of new industries, electricity is expected to play an increasingly important role.

In 2022, global electricity generation totalled 29,200 TWh, up 2.4-fold compared to 1992, having increased by roughly 16,800 TWh over a 30-year period. The G7 countries, including the EU, generated 9,400 TWh of electricity in 2022, which was just 2,000 TWh, or 27 percent, above their generation volumes 30 years prior. In fact, over the past decade this region has been stagnating in this sector. As a result, the share the so-called developed countries in terms of electricity generation dropped from a respectable 59 percent to a more modest indicator of 32 percent. Meanwhile, the BRICS+ countries witnessed a 5.3-fold surge in electricity generation over the same 30-year period, from 2,600 TWh to 13,900 TWh, and now account for 67 percent of the global growth in power generation. Accordingly, the BRICS+ countries were able to more than double their share of the electricity generation market from 21 percent in 1992 to 48 percent 30 years later. They may have still a long way to go before they reach the dominating heights the G7 used to enjoy in the early 1990s, but they are well past the inflection point.

There have been some curious processes within the Group of Seven over the past ten years too. Electricity generation increased across the G7 between 1992 and 2012 with a 30 percent increase in the United States, 27 percent for the EU, 22 percent in Canada, 20 percent in Japan, and 13 percent in the UK. However, the third decade of this 30-year cycle was a total failure for Europe in terms of growing its power generation sector. The UK experienced a 10-percent decline in its generating capacity (38 TWh), generation decreased in Japan by 7 percent (73 TWh), and the same

## ELECTRICITY GENERATION, TWh



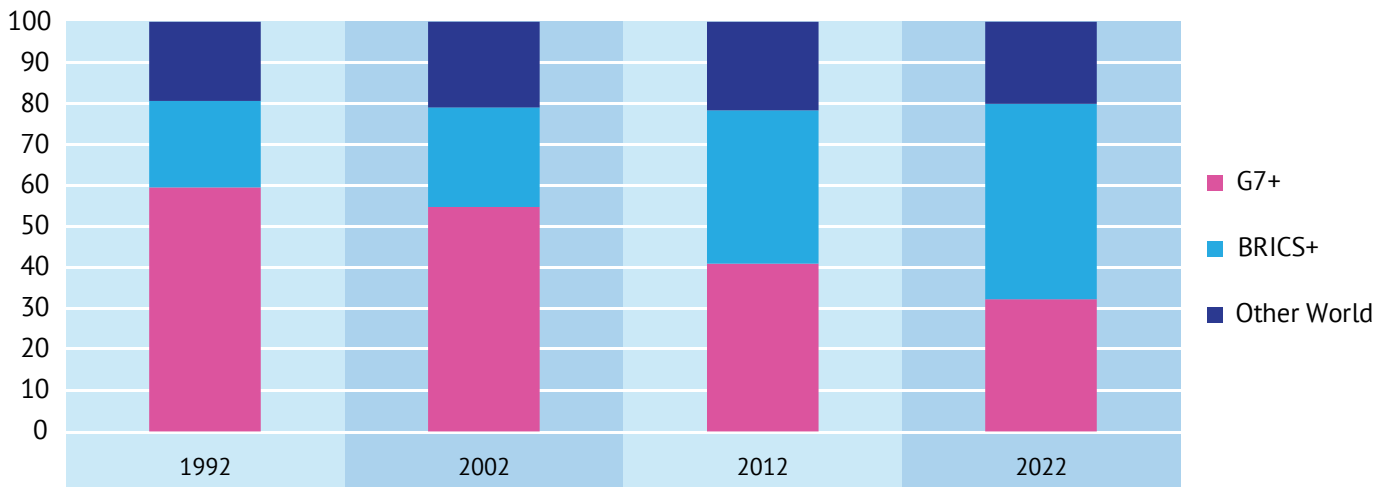
Source: Energy Institute Statistical Review of World Energy, calculated by the author

indicator declined by 4 percent in the EU (120 TWh). Meanwhile, their overseas partners witnessed a clear, albeit modest, increase of 4 percent for Canada (23 TWh) and 5 percent for the United States (237 TWh).

There have also been significant shifts among the BRICS+ countries. In 1992, the Russian Federation was ahead of all other countries now forming this association in terms of electricity generation with a 38 percent share. By 2022, China emerged as an uncontested leader not only within the BRICS+ format, but also at a global scale, having surpassed the United States as early as in 2011. Since 1992, electricity generation in China surged by a factor of 11 to exceed the aggregate generating capacity in the United States, the EU, Japan and the UK combined by over 8,800 TWh. This amounts to 30 percent of the global electricity generation and 64 percent of electricity generation within the BRICS+ countries.

Meanwhile, other BRICS+ countries, or at least most of them, have also made a lot of headway in this sector, which is largely attributable to a low-base effect compared to 1992. Ethiopia increased its power output 13 times, the UAE saw an 8-fold surge, Iran and India roughly quintupled their output, Saudi Arabia and Egypt quadrupled it, and Brazil almost tripled its electricity generation. South Africa increased its power generation by 50 percent over this 30-year period, while Russia had a 15-percent increase. Despite this modest growth rate, Russia retained its position as a top 3 country within BRICS+ in terms of electricity generation and a top 5 global producer.

## ELECTRICITY GENERATION, %

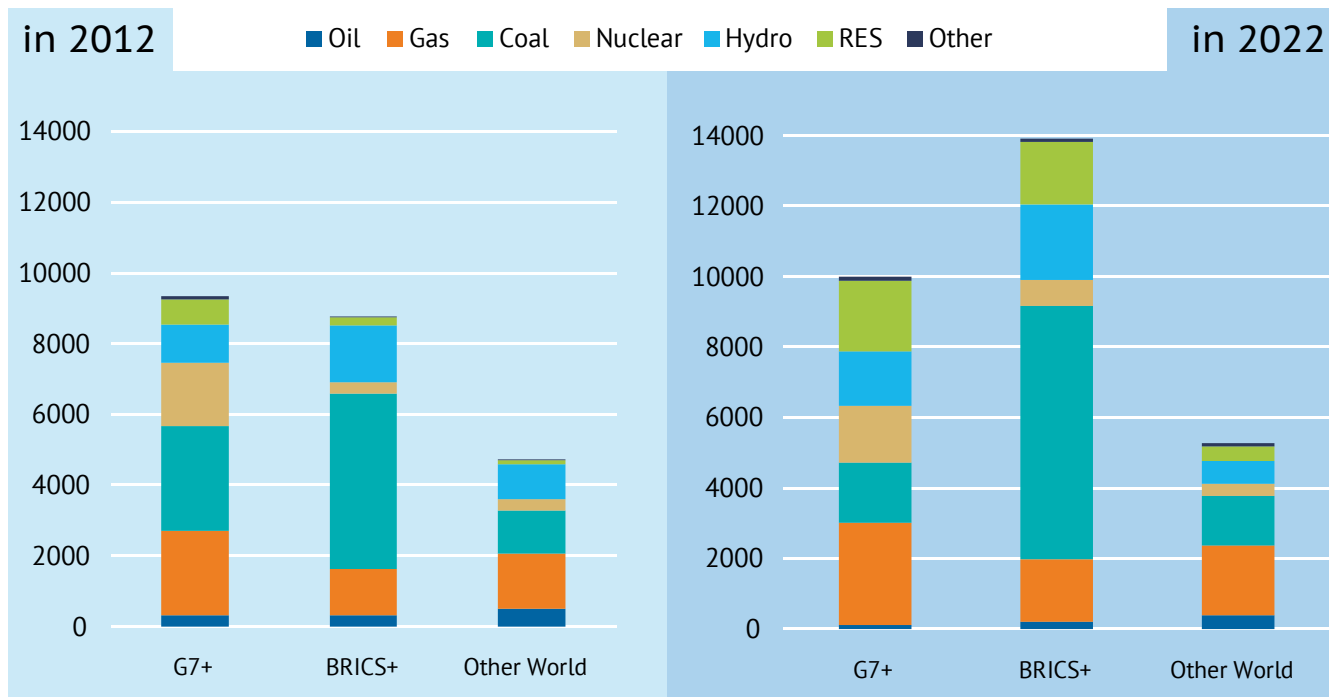


Source: Energy Institute Statistical Review of World Energy, calculated by the author

The structure of the electricity generation market has also been changing in interesting ways for the Group of Seven and BRICS+. In 2012, coal, natural gas and petrochemicals accounted for almost 60 percent of power generation, or 32 percent, 26 percent and 3 percent, respectively. In 2022, the share of these three energy sources declined to 47 percent, with natural gas reaching 29 percent, while coal and oil dropped to 17 percent and 1 percent, accordingly. Some countries have been proactive in pushing for an energy transition, even if coal generation still plays an important role there despite a 40 percent decline. At the same time, the share of hydropower generation increased 1.5-fold from 10 percent to 15 percent, and there was even more momentum in the renewables sector with a 2.5-fold surge from 8 percent to 20 percent. The fact that the share of nuclear power declined from 11 percent to 8 percent is also worth noting.

The G7 countries worked on scaling down coal generation and reduced it by 1,200 TWh, but BRICS+ not only offset these results but added more coal to the energy mix (plus 2,200 TWh). This was mainly driven by China's 1,700 TWh increase, and to a lesser extent India (plus 600 TWh). But the story does not stop here. In fact, the BRICS+ countries, primarily China, demonstrated a lot more growth in generating electricity from new renewable sources of energy with a 7.7-fold increase over ten years compared to a 2.8-fold increase for the G7. In 2022, China generated almost as much electricity from renewables (1,37 TWh) as the United States and the EU combined (1.52 TWh). This means that the developed countries can no longer claim leadership not

## ELECTRICITY GENERATION BY FUEL, TWh



Source: Energy Institute Statistical Review of World Energy, calculated by the author

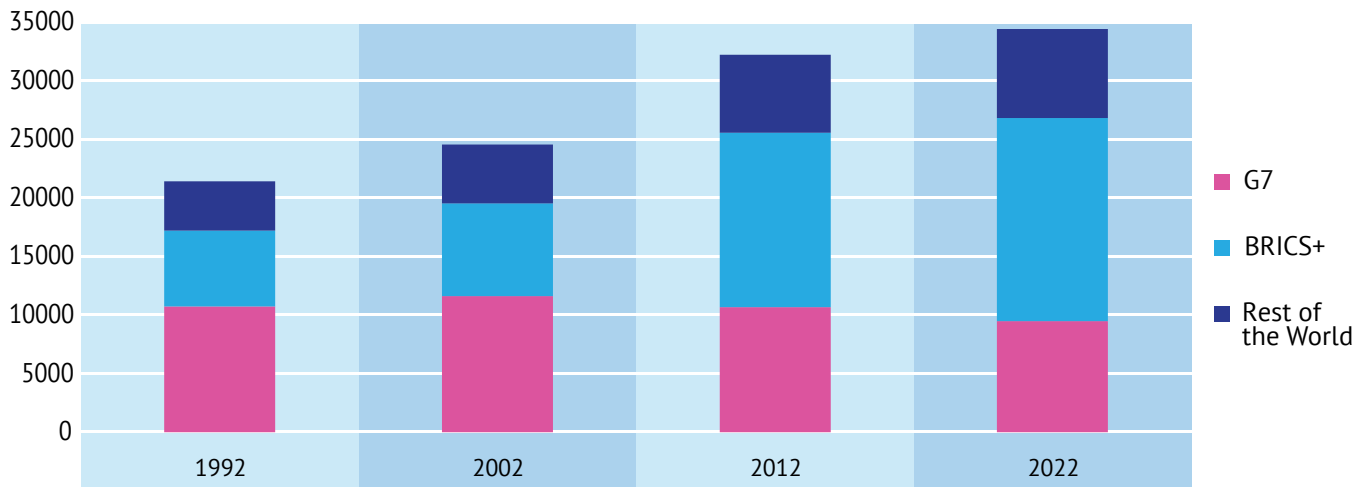
only in conventional electricity production, but also in this key and most progressive segment of this market.

The G7 retained a serious edge only in the nuclear generation sector. In 2022, these countries generated 1,600 TWh at their NPPs, compared to just 0.74 TWh for BRICS+. Still, over the past decade the BRICS+ countries doubled their electricity generation at NPPs (up 400 TWh), while this indicator was down 11 percent or by 200 TWh for the G7.

## BRICS+ and the low-carbon agenda of the collective West

The BRICS countries are of particular interest when it comes to low-carbon energy and economics, as they offer great opportunities, are contemplating plans to develop peaceful atom, and account for about half of the world's hydropower. The BRICS countries hold about 20 percent of the world's proven reserves of lithium, more than 75 percent of the

## CARBON DIOXIDE EMISSIONS FROM ENERGY, MILLION TONNES

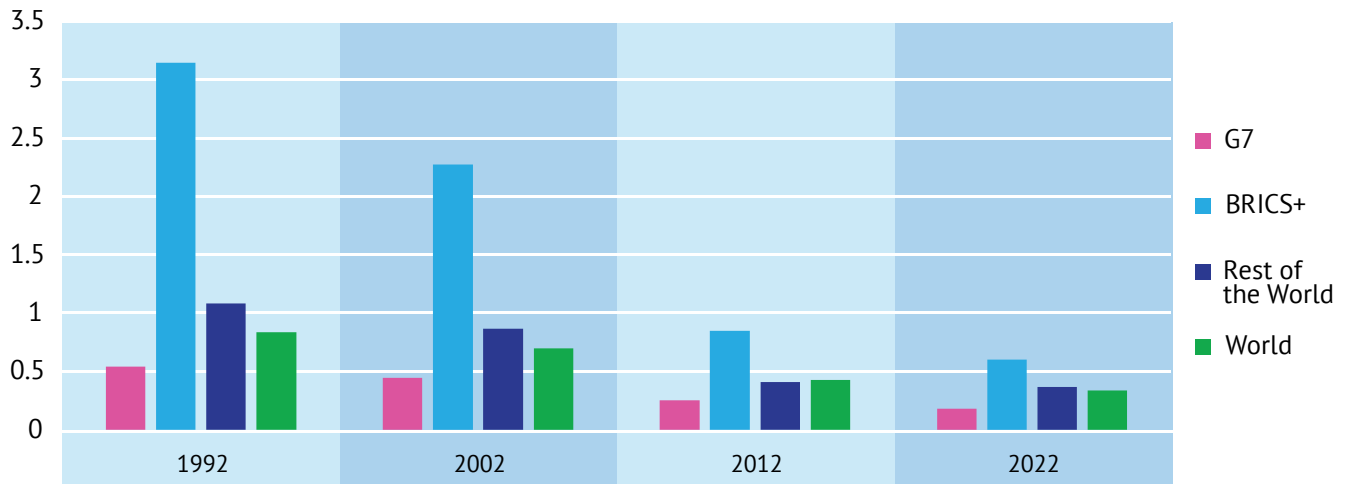


Source: Energy Institute Statistical Review of World Energy, calculated by the author

world's reserves of rare earth metals, and substantial nickel reserves. These commodities are critical for the production of equipment in the renewable energy sector. In addition, the strongest BRICS power, China, is now the absolute leader in manufacturing equipment for solar power plants, electric vehicles and even electrolyzers that extract hydrogen from surplus electricity, primarily at wind and solar power plants, not to mention the rate of putting into operation new renewable electricity generation facilities.

At the same time, when it comes to carbon dioxide emissions in the energy sector, which may soon become subject to carbon border tax, drastically restricting market access for goods from countries with a significant 'carbon footprint,' the picture is not so rosy for the BRICS members and even threatening for their socioeconomic development plans.

In 1992, global CO<sub>2</sub> emissions from energy totalled 21.4 billion tonnes. The share of the G7 countries (in its current composition including the EU) was exactly 50 percent (10.7 billion tonnes). The future BRICS countries produced only 6.5 billion tonnes of emissions, or 30 percent of the global total. Thirty years later, the situation has changed dramatically. The G7 has reduced emissions by 11 percent to 9.5 billion tonnes, while BRICS+, by contrast, has increased emissions

CO<sub>2</sub> PER \$1000 GDP (NOMINAL), TONNES

Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

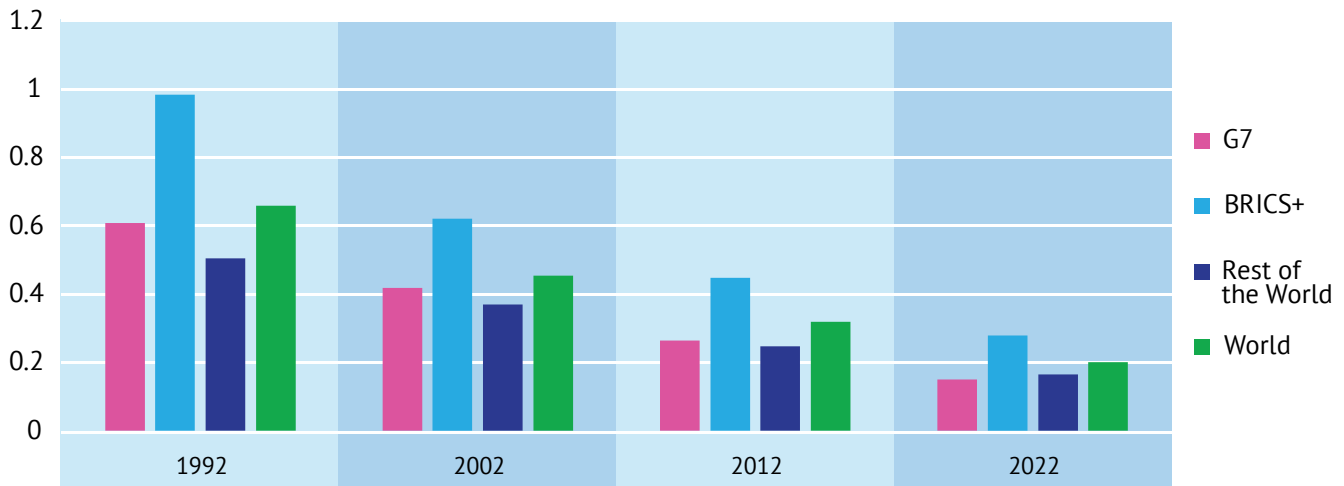
by 170 percent to 17.3 billion tonnes. In 2022, BRICS+ energy's share of global emissions was over 50 percent, while the G7 emitted around 28 percent. Meanwhile, overall, global CO<sub>2</sub> emissions have increased by 13 billion tonnes or 60 percent in thirty years.

However, it is worth noting that in absolute terms, the growth of emissions has slowed down significantly in BRICS+ as well. Growth peaked between 2002 and 2012 at 6.9 billion tonnes (an increase of 87 percent), exceeding the combined emissions of the US and the EU in the same year. But in the following decade, CO<sub>2</sub> emissions in BRICS+ climbed much more moderately, by just 2.5 billion tonnes (19 percent).

Global energy efficiency is growing at a very high pace. While in 1992, global carbon intensity was 834 kilograms of CO<sub>2</sub> emissions per \$1,000 of nominal GDP, in 2022, this figure dropped by 60 percent to 340 kilograms. Moreover, in the G7, emissions per unit of nominal GDP fell by two thirds, to 183 kilograms, and in BRICS+, by 80 percent (from 3.1 tonnes to 606 kilograms). However, the BRICS+ countries still emit three times more CO<sub>2</sub> per unit of nominal GDP on average.

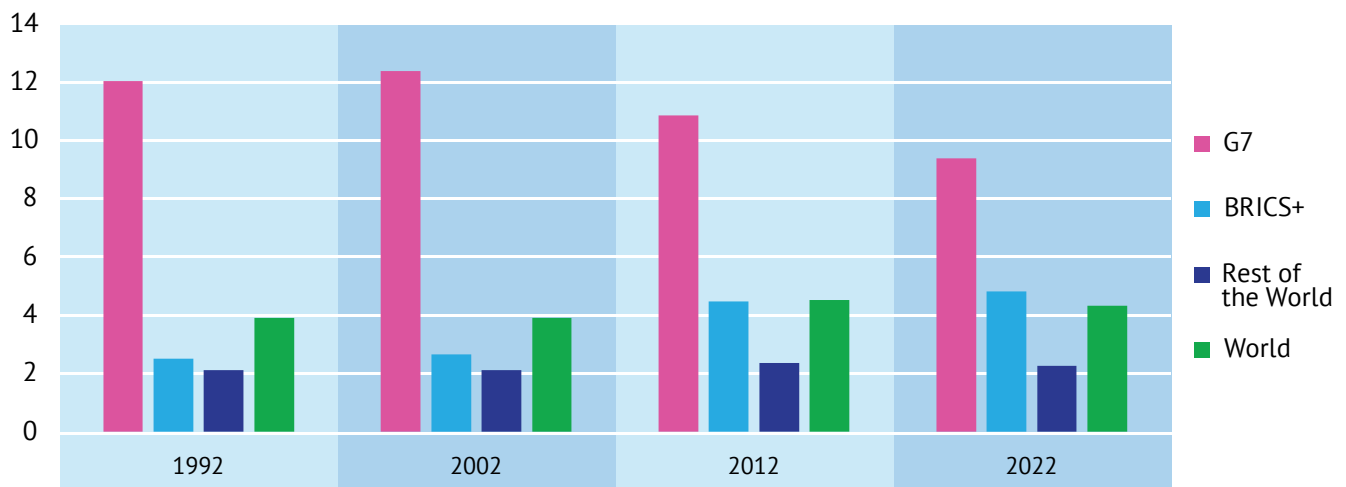
The GDP (PPP) figures paint a more contradictory picture. The bloc of leading Western economies has cut CO<sub>2</sub> emissions by three quarters since 1992, from 608 to 150 kilograms per \$1,000. BRICS+ cut them by slightly

## CO<sub>2</sub> PER \$1000 GDP (PPP), TONNES



Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

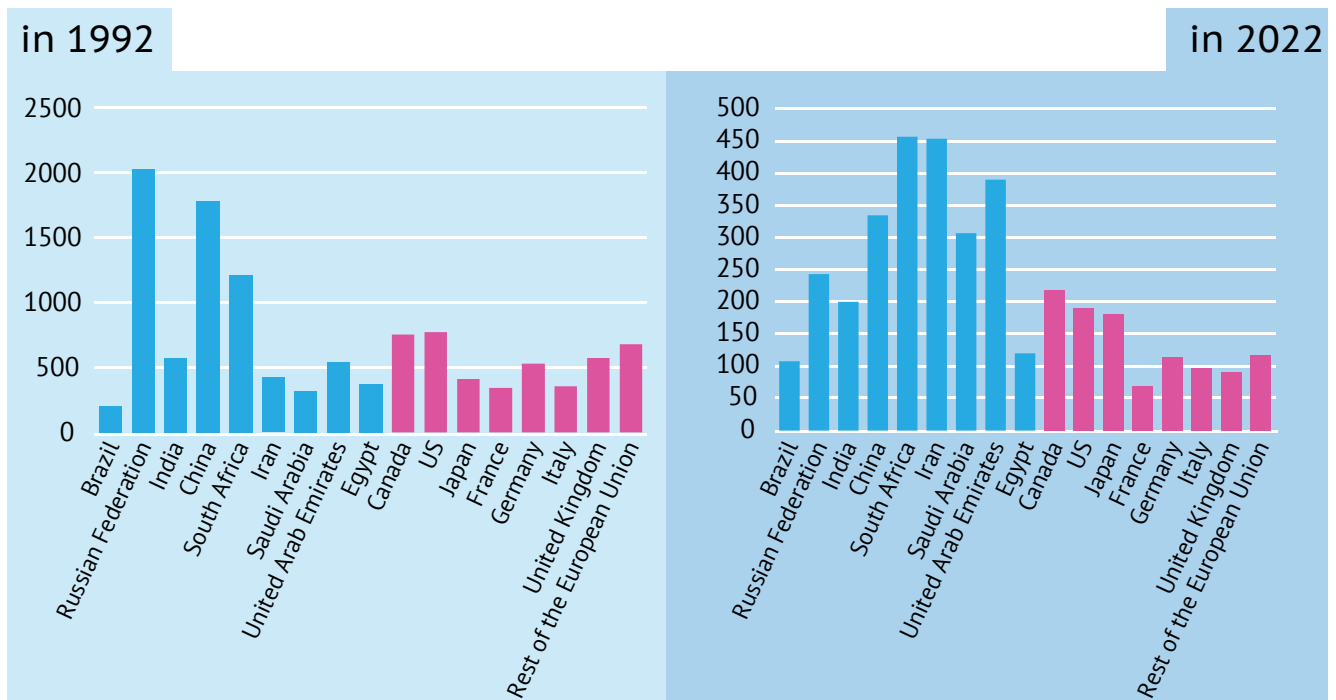
## CO<sub>2</sub> PER CAPITA, TONNES



Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

over 70 percent to 278 kilograms. BRICS+' carbon footprint decreased by a factor of 3.5 to 278 kilograms per \$1,000 and thus the difference between BRICS+ and G7 climbed from 60% to 90%.

On the other hand, CO<sub>2</sub> emissions per person are several times higher in the G7 countries than in BRICS+. In 1992, the figure was 12 tonnes per person, 380 percent above the greater BRICS and three times the global

CO<sub>2</sub> PER CAPITA BY COUNTRIES, TONNES

Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

average. In 2022, developed economies' per capita emissions fell by 21 percent to 9.4 tonnes. In BRICS+, the same figure almost doubled in thirty years, rising from 2.5 to 4.8 tonnes per person per year. But, as we can see, energy consumption and, consequently, per capita CO<sub>2</sub> emissions in the G7 are still very far ahead of both the BRICS countries and the rest of the world.

It is also interesting that marked differences in relative emissions per unit of GDP have been observed within both blocs. In BRICS+, their 1992 level varied from 200 kilograms per \$1,000 of nominal GDP in Brazil, where the share of hydropower plants is high, to 2 tonnes in the Russian Federation after the collapse of the Soviet Union. In the G7 countries, the variance was smaller, from 340 kilograms in France to 767 kilograms in the United States.

In 2022 in BRICS+, this indicator varied between 108 kilograms of emissions per unit of GDP in Brazil and 457 kilograms in South Africa. In contrast, Russia's emissions fell 88 percent to 243 kilograms per \$1,000 of nominal GDP, which was 20 percent less than China's and almost on par with Canada's level (217 kilograms per unit of GDP).

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## Conclusion

The BRICS+ countries have demonstrated higher-than-anticipated growth in terms of their consumption of energy resources over the past decades, and still have a lot of room for further upping their game. In 2022, per capita primary energy consumption for the BRICS+ countries was just 76.6 gigajoules. This indicator has more than doubled since 1992, but the average for the G7 countries and the EU is still higher by a factor of 2.5.

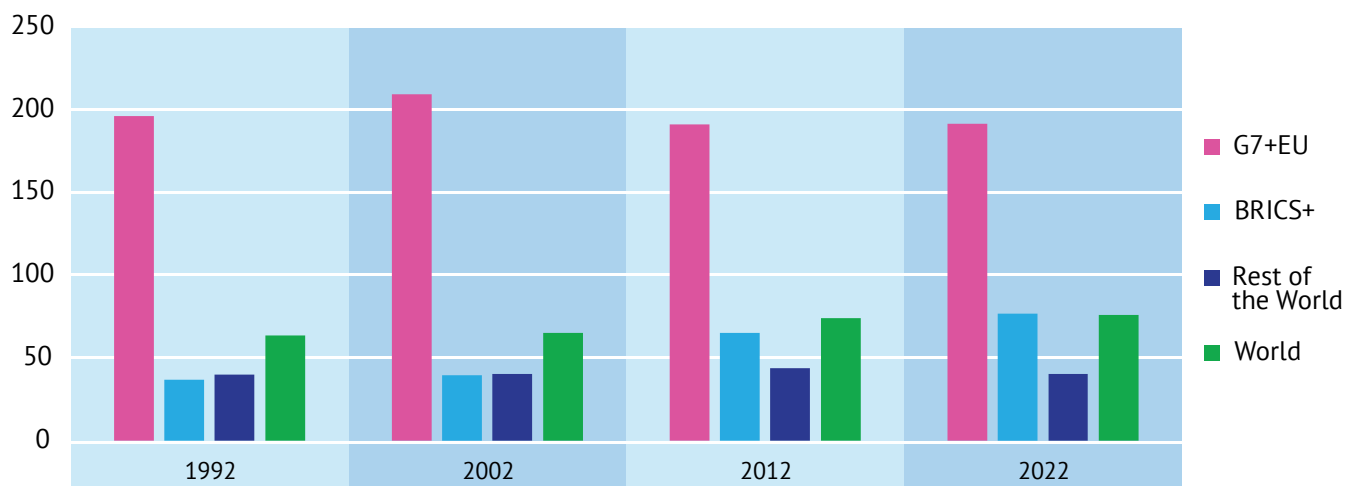
At the same time, there has been no significant decline in per capita energy consumption in the developed countries. Over the past 30 years, it decreased by just 2.5 percent, or 5 gigajoules. The remaining 150 countries around the world consume just 40 gigajoules per person, on average, which demonstrates, among other things, that much of the world's population experiences extreme energy poverty. Moreover, this figure is even lower for most countries, since industrially developed countries with high levels of energy consumption outside of the Group of Seven or BRICS, such as South Korea, Australia and Turkey, have somewhat embellished the overall statistics.

In fact, nothing is being done to resolve this issue, despite all the rhetoric coming from the G7, which has been talking about combating energy poverty as its major priority for decades now. In 1992, countries outside of the G7 and BRICS had the same level of per capita energy consumption of about 40 gigajoules.

One thing to keep in mind is that the average figures for the G7 and BRICS also fail to reflect the actual picture. For the rich world, per capita consumption varies from 104 gigajoules in Italy to 363 gigajoules in Canada, which means an almost four-fold difference, which may be attributable to the fact that Canada is a major energy exporter, and has a harsher climate too. There is a major discrepancy in the way energy demand has been shrinking. Over the past 30 years, per capita energy consumption decreased by 30 percent in the UK, 29 percent in France and 18 percent in Germany. Meanwhile, Japan, Canada and the United States saw a decline of just 9 to 10 percent.

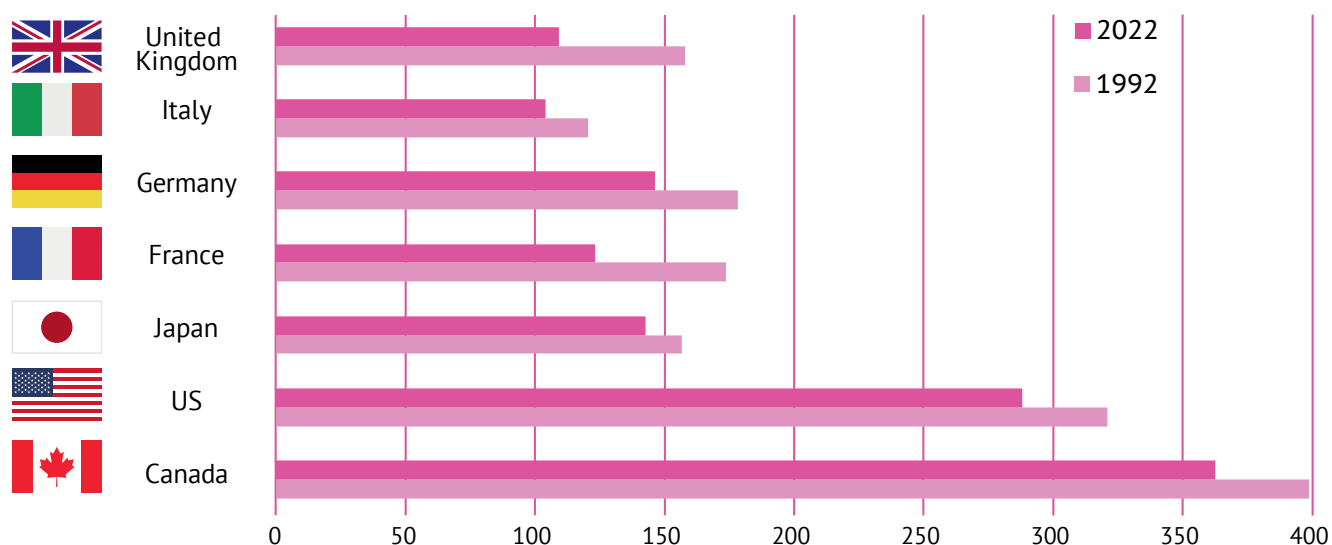
However, compared to the G7, there is an even greater statistical discrepancy within BRICS+, even without taking into consideration Ethiopia's abnormally-low energy consumption of less than 10 gigajoules per person, which reflects the overall situation in East Africa. We must also take the UAE out of the equation, since per capita primary energy consumption there was double that of the United States in 2022. In India, this indicator was equal to 25.7 gigajoules, while Egypt reported 35.9

## PRIMARY ENERGY CONSUMPTION PER CAPITA, GJ



Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

## PRIMARY ENERGY CONSUMPTION PER CAPITA, GJ

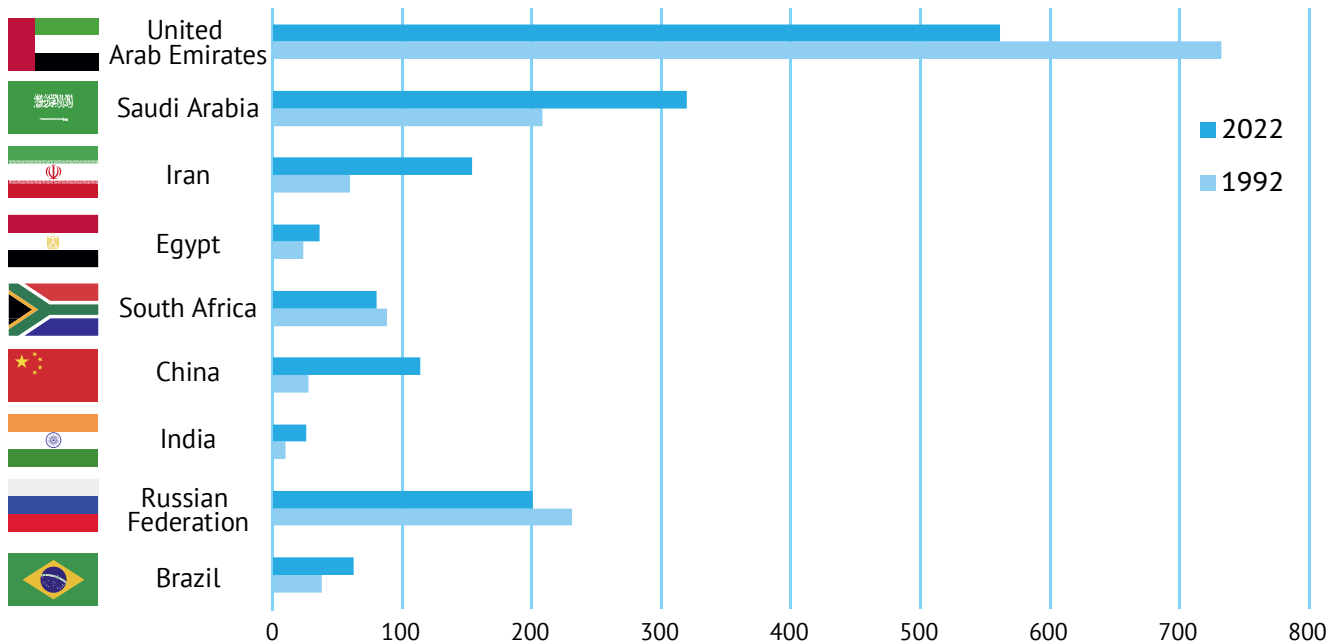


Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

gigajoules, Brazil had 62.4 gigajoules, South Africa had 80 gigajoules, China came in under 114 gigajoules, Iran had almost 154 gigajoules, Russia exceeded 200 gigajoules, and Saudi Arabia had 319 gigajoules.

In addition, these countries also took different paths in terms of their energy consumption patterns over the past 30 years. Energy consumption declined in the UAE, Russia and South Africa by 23 percent, 13 percent and 9 percent, respectively, while it surged several-fold in China, Iran and India. In fact, China increased its per capita energy consumption by a factor of four, Iran saw a 2.6-fold increase, and India was up 2.5-fold. In Brazil, this indicator

## PRIMARY ENERGY CONSUMPTION PER CAPITA, GJ



Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

increased by 67 percent, while Saudi Arabia and Egypt reported increases of 53 percent and 50 percent, respectively.

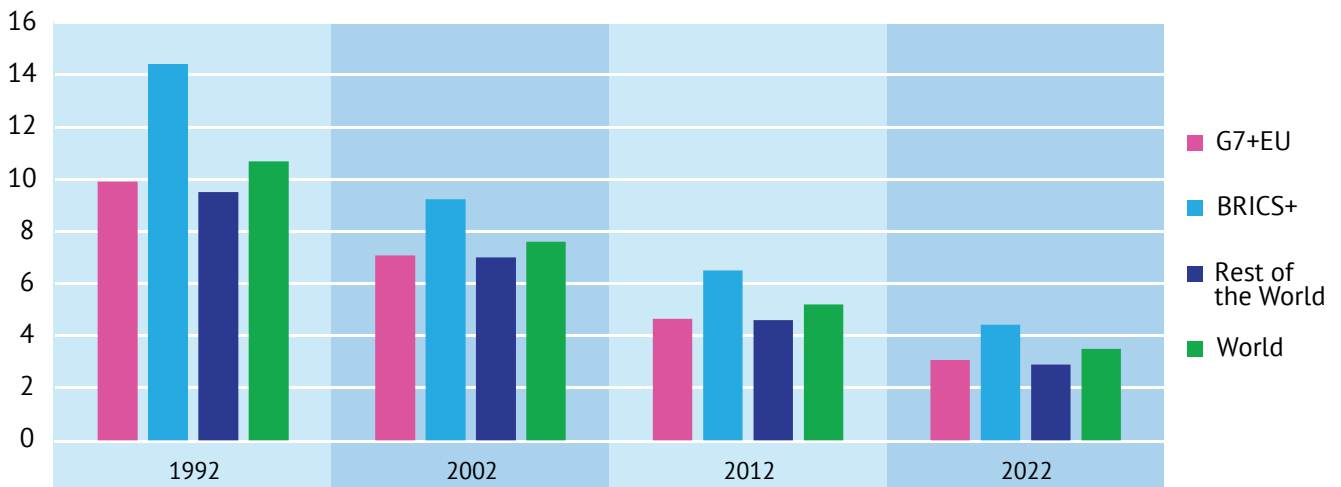
China has basically reached European-level per capita energy consumption, even if it remains behind Japan by 28 percent, while energy consumption in the United States, its immediate economic rival, is 2.5 times higher. As for India, its energy consumption is four times lower compared to China.

That said, the BRICS economies have managed to outpace the G7 in terms of improving their energy efficiency. In 2022, the gap between them in terms of per capita primary energy consumption per \$1,000 of GDP (PPP) decreased to 4.4 gigajoules against 3.1 gigajoules. In 1992, the G7 had 9.9 gigajoules, and the BRICS countries had 14.4 gigajoules.

Russia demonstrated the best performance in this domain, having improved its energy efficiency by a factor of seven over the past 30 years. In 1992, it used 33.7 gigajoules per \$1,000 of its GDP (PPP), but in 2022, the Russian economy needed just 4.8 gigajoules, which was lower than in China with 5 gigajoules, or Canada, which is also a northern country in G7, with 5.9 gigajoules.

The UK and Italy were the top performers in terms of their energy efficiency within the G7 with per capita energy consumption of

## PRIMARY ENERGY CONSUMPTION PER \$1000 OF GDP (PPP), GJ



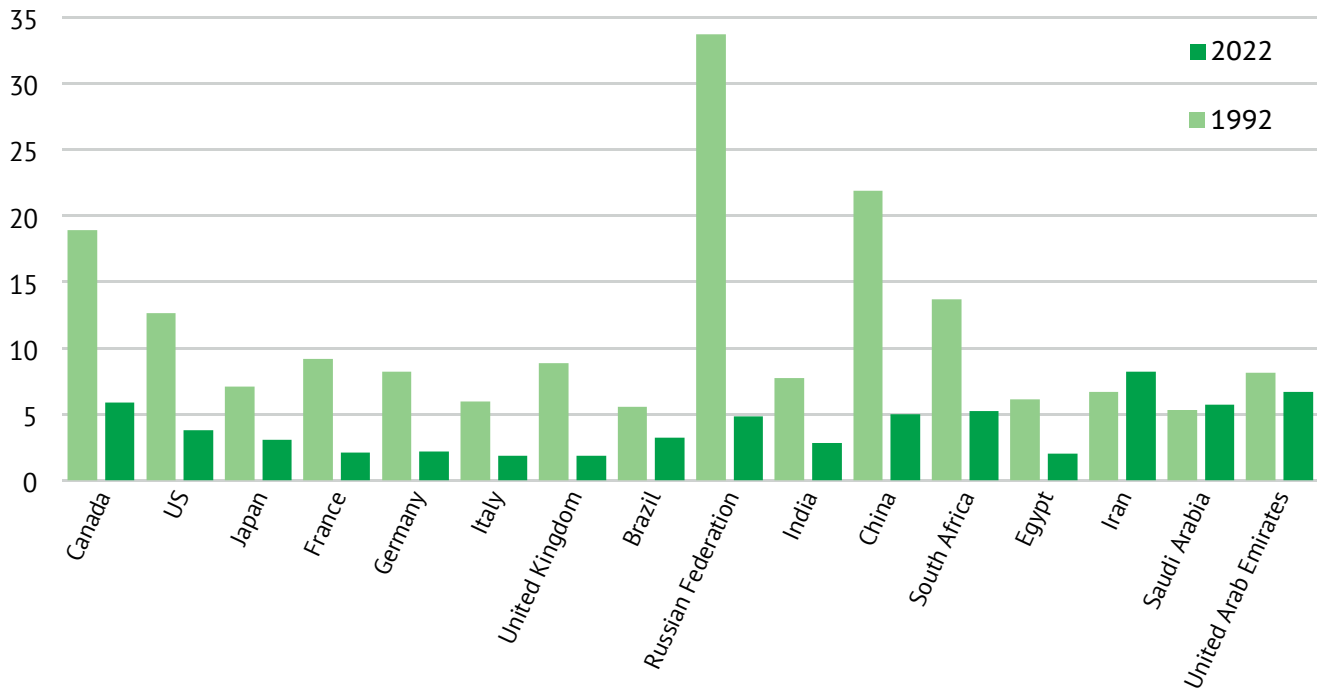
Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

1.9 gigajoules per \$1,000 of their GDP (PPP), while Egypt (2 gigajoules) and India (2.8 gigajoules) stood out within BRICS+. This indicator was equal to 3.8 gigajoules for the United States.

Translating this potential into mutually beneficial energy policy has become imperative for BRICS+. But it remains to be seen whether, and how, they can reach new heights in their cooperation and generate positive momentum in trade and mutual investment in the energy sector. They will have to come to an understanding on addressing the multiple challenges they face in terms of their energy security, dealing with the regulatory frameworks, financial and climate policies of the so-called first-world countries. To deliver on this objective, BRICS+ will have to come up with its own vision for the energy sector instead of staying at the G7's tail end with its futuristic projections for the energy sector.

BRICS has been able to outline specific steps for stepping up energy cooperation since its first summit in Yekaterinburg back in 2009, but has been quite slow on this front. The first BRICS Energy Ministers' Meeting did not convene until 2015. It became a point of departure for institutionalising interstate energy dialogue. It took another four years for BRICS to establish the *Energy Research Co-operation Platform*. Still, all these efforts have not yet produced any meaningful multilateral solutions in terms of nurturing institutions that would support and protect energy trade among the BRICS countries, facilitate mutual investment in the energy sector and enable them to work together to reach common ground and promote the interests of the BRICS countries regarding the climate agenda and the sustainable development of energy systems and economies.

## PRIMARY ENERGY CONSUMPTION PER \$1000 OF GDP (PPP), GJ



Source: Energy Institute Statistical Review of World Energy, World Bank, calculated by the author

When the G7 countries decided to strangle the Russian economy and its energy sector by imposing sanctions, this required an urgent effort to offer alternative trade mechanisms, including for shipping energy resources, insurance and settlements, and these solutions had to be developed from scratch. In 2023, Russia's oil deliveries to India surged 18 times compared to 2021, from 4.5 million tonnes to 82 million tonnes, while oil exports to China increased by a third, from 80 million tonnes to 107 million tonnes. In fact, these two BRICS partners accounted for 78 percent of Russia's crude oil exports, up from just 32 percent as recently as in 2021. At the same time, India and China tripled their exports of petroleum products to Europe from 12 million tonnes to 36 million tonnes. The system of settlements also underwent drastic changes, which went beyond payments for Russia's energy resources after the United States and Europe made it impossible for Russia to rely on their financial systems. Other exporters were affected too. In particular, Saudi Arabia had a 50-year agreement with the United States which designated the US dollar as the only currency for buying the Saudi oil. This deal expired this year, and Saudi Arabia decided not to renew it, while launching pilot projects with China to use the renminbi in oil exports. Therefore, BRICS must move to institutionalise and introduce system-wide solutions for creating a resilient settlement framework when trading energy resources. It must be immune to unilateral sanctions or other unfriendly steps by the United States and its satellites from the developed world.

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